ducing structures in steel as admirably as those they design in stone? Partly, no doubt, because they are hampered by tradition. They have not yet fully realised the difference in spirit that must characterise fit designs in the newer and the older materials. No one can be an artist in any material the possibilities and limitations of which he has not fully mastered. Again—if a common engineer may venture the criticism—the architect, as a rule, has not sufficiently mastered the *science* of construction, and has been too much addicted to taking the easy course of adopting a decorated treatment instead of striving to secure elegance of structural scheme as such; and decoration, at least on anything like traditional lines, is wholly incompatible with the best possibilities of steel as a structural material. Progress is being made in the art of designing efficient and graceful structures in metal, but the best results can only be attained by a designer who has a thorough scientific and technical knowledge of the properties of steel and the processes of its manipulation on the one hand, and cultured artistic sense and capacity on the other. These should not be considered as appropriate equipments for separate professions.

There are many, however, who have a rooted conviction that structures in steel can never be so beautiful as those in stone. This I believe to be altogether wrong. It arises partly from the crudity of design that characterises most of the steel structures that have yet been erected, and partly from preconceived notions as to what is fitting in proportions and massiveness. We can quite imagine that a native of the Congo region whose notions of the proportions suitable and comely for a quadruped were founded on his familiarity with the hippopotamus would, at first sight, consider the racehorse sadly lacking in substance and solidity; but, in time, he might come to recognise some measure of gracefulness in a creature that has been developed to meet requirements that hitherto he had not fully considered.

Mr. Wells has said in his "Modern Utopia," "the world still does not dream of the things that will be done with thought and steel when the engineer is sufficiently educated to be an artist, and the artistic intelligence has been quickened to the accomplishment of an engineer." But we need not postpone until the advent of a complete Utopia, the full realisation of our duty to practise our profession, as far as in us lies, with due regard for the material interests and the æsthetic susceptibilities of all who can be affected by the works for which we are responsible.

NOTES.

A PUBLIC meeting will be held at the Mansion House on Wednesday, October 23, in support of the memorial to Lord Lister.

THE superintendent of the Meteorological Office Observatory at Eskdalemuir, near Langholm, Dumfries, reports that the seismographs at the observatory recorded a large earthquake at 11.30 p.m. on September 13. The centre of the disturbance is indicated at latitude 40·4° N., longitude 27° E., a point situated at the south coast of the Sea of Marmora.

WE learn from *The Lancet* that the Riberi prize of the University of Turin, amounting to 20,000 lire (about 800*l.*), will be awarded after the close of the year 1916 for the work which is adjudged to have most advanced the science of medicine. Such work, if published, must have been printed after 1911. Or it may be sent in before the end of 1916, in print or typoscript—the English language is admissible. Further information may be obtained from Prof. Dr. Oliva, Turin.

A SPECIAL number of the *Atti della R. Accademia dei Lincei*, containing the report of the proceedings at the anniversary meeting last June, announces a gift of 4000*l.* from Dr. Gino Modigliani towards the publication of the works of Leonardo da Vinci, and a legacy to the academy of 2000*l.*, as well as of many of her personal effects, from the estate of the late Signora Celli Dutuit. Prizes given by the King of Italy have been awarded to Prof. Ernesto Manasse for mineralogy and geology, and to Prof. Giuseppe Chiovenda for jurisprudence and political science. The Minister of Public Instruction also gives four prizes, each of which has this year been divided, the recipients being Profs. G. Ercolini and A. Amerio for physics, Profs. A. Quartaroli and R. Salvadori for chemistry, and Profs. Enrico Carrara, Donadoni Eugenio, Levi Ezio, and Ribezzo Francesco for the two philology prizes. A prize founded by Santoro is awarded to Prof. Costantino Gorini for his discoveries in the bacteriology of cheese, while another most useful prize, founded by the late Alfonso Sella for assistant lecturers in the department of physics, is awarded to Dr. Paolo Rossi, of the University of Naples.

WE announced with regret last week the death on September 4, at forty-two years of age, of Dr. Stanley Dunkerley, formerly professor of engineering in the University of Manchester. Dr. Dunkerley was educated at the Burnley Grammar School and Manchester University, where he graduated in 1900 with honours in mathematics, and took, a year later, the degree in engineering. After two years on the construction work of the Manchester Ship Canal, he obtained the Bishop Berkeley fellowship, and returned to the University to carry out researches in the Whitworth Engineering Laboratory under the direction of the late Prof. Osborne Reynolds. Dr. Dunkerley held appointments as assistant-lecturer in engineering at Liverpool University and at Cambridge. In 1897 he was appointed professor of applied mechanics at the Royal Naval College, resigning in 1905 to succeed Prof. Osborne Reynolds at the Manchester University. He had only held this post three years when ill health compelled him to resign. Dr. Dunkerley was strongest on the mathematical side of engineering. His most important contributions to engineering science are the paper on the whirling and vibration of shafts published in the Transactions of the Royal Society, and an investigation of the straining actions in crank shafts, which appeared in the transactions of the Institute of Naval Architects. He was the author of text-books on mechanism and hydraulics. In 1905 his University conferred on him the doctor's degree in science, and in the same year he was elected a member of the Institution of Civil Engineers.

THROUGHOUT the wide circle of mining engineers the announcement of the death of Mr. J. A. Chalmers at Bournemouth, on September 9, will be deeply regretted. Born in 1864, son of the Rev. Dr. Chalmers, an esteemed missionary in China, Mr. Chalmers in 1889 took his diploma as an Associate of the Royal School of Mines, and left the same year to take up professional duties in the Transvaal. There he afterwards became an assistant engineer to the Consolidated Goldfields of South Africa, under J. H. Hammond. Apart from the important work which came to him in this connection upon the Rand, Mr. Chalmers, with Dr. F. H. Hatch, accompanied Mr. Hammond when, in 1894, this engineer made an important mining reconnaissance into Rhodesia, a land which had not at that time long been under British influence. Later, in the year 1895, he collaborated with Dr. Hatch in the preparation of "The Gold Mines of the Rand," the first important work on the Witwatersrand Goldfields. Mr. Chalmers was thus by his own good work forced to the front, and during the next ten years important commissions took him for their fulfilment to all parts of the world. Then it was found that a disease, all unsuspected, had taken a hold on him that attention and skill could do nothing to loosen. Slowly but surely Mr. Chalmers sank, Davos put off the day, Bloemfontein the hour, but six weeks after his return to this country death came, at the early age of forty-eight. During all this time the many friends which his modesty had made for him failed not in frequent inquiry, and now that he has gone all mining engineers, even the most self-assertive, will cherish the memory of this man of quiet quality.

THE new Allegheny Observatory, situate in Riverview Park, Pittsburg, was dedicated on the afternoon of Wednesday, August 28, in the presence of the members of the Astronomical and Astrophysical Society of America and of many of the Pittsburg friends of the institution. The principal instruments of the new observatory are a 13-in. visual refractor, a 30-in. reflector (a memorial to the late James Edward Keeler), and a 30-in. photographic refractor (a memorial to William Thaw and his son, William Thaw, jun.). The last of these telescopes is not quite completed, as the objective remains to be supplied. Addresses were given by Dr. John A. Brashear, chairman of the observatory committee; by Dr. Samuel Black McCormick, Chancellor of the University of Pittsburg, of which the observatory forms the astronomical department; by Dr. Frank Schlesinger, director of the Allegheny Observatory; and by Prof. E. C. Pickering, director of the Harvard College Observatory. Mrs. William Reed Thompson, the daughter of William Thaw and the sister of William Thaw, jun., closed the ceremony with the unveiling of the memorial tablet on the Thaw telescope.

THE objections which were indicated some time ago in *Engineering* to the style of monoplane which is dependent on the rotary type of engine have been illustrated by the death of four army officers in one week, and give occasion for a strong article in our contemporary for September 13. The French Deperdussin monoplane, in which Captain Hamilton and Lieutenant Stuart lost their lives, broke in the air; as this machine won the 2000*l*. prize in the War Office competition it is not unreasonable to suppose that it represents the most advanced stage of monoplane construction. Its failure shows that however much care may be exercised in the choice of a monoplane of the ordinary type, it cannot be absolutely trusted to last for a month without breaking in mid-air. The cause of the failure of the Bristol monoplane, in which Lieutenants Hotchkiss and Bettington were killed, was not brought to light at the inquest. The Deperdussin failure, it seems to be generally agreed, was caused by some part of the revolving engine failing and wrecking the aëroplane. A real endeavour should be made to secure a supply of engines of other than the revolving type. Where this type has to be used some provision should be made for safety in case of parts breaking. This might be done by placing a strong shield between the engine and any parts it might otherwise damage.

AT the French Army manœuvres some portable apparatus for wireless telegraphy on aëroplanes, designed by M. Rouzet, is being officially tested under war conditions. M. Rouzet's apparatus, which was described recently by the Paris correspondent of *The Morning Post*, embodies the novelty—so far as aëroplane work is concerned—of using a rotating spark-gap. This consists of a fixed and a movable disc each carrying a number of metal points between which the sparks pass while the movable disc is rotated rapidly. The disc, and also a small alternator, are driven by the aëroplane motor, and the current, which is generated at a pressure of 110 volts, is raised to 30,000 volts by a transformer, and led to a condenser and to the gaps. By setting the disc properly with respect to the dynamo windings and poles, the sparks can be made to occur when the condenser is just fully charged. The advantages of this mode of operation are, of course, very well known as regards larger units, but it seems that rotating spark-gaps have not been used before in French aëroplane work. The oscillations produced by the discharge of the condenser through the spark-gap are transferred to the antenna by means of a high-frequency auto-transformer of the Oudin pattern. The antenna consists of an aluminium wire 100 ft. long, and can be rolled up or unrolled by the operator by aid of a small winch, while provision is made whereby the pilot can cut the antenna adrift in case of necessity. Instead of the earth connection employed in a land or ship station, a wire network is, as usual, spread along the wings of the aëroplane, and thus the antenna and its "electrical counterpoise" constitute a self-contained Hertzian oscillator. The power of the dynamo is 200 watts, and the distance already worked over is between fifty and sixty miles.

A LECTURE on non-operative methods as applied to cancer was delivered by Prof. V. Czerny, of Heidelberg, on September 16, before the Association of German Naturalists and Physicians at Münster, in Westphalia. From a report in *The Morning Post*, we learn that Prof. Czerny confessed at once that a specific cure for cancer had not yet been discovered, and perhaps never would be found. Every year, he said, we hear of new discoverers who promise more or less infallible results, but close examination of their specifics shows their worthlessness. Within the last year or two chemical therapeutics had received a fresh impulse of scientific value owing to the results of experiments on animals, and it was now tolerably certain that blood treatment must take the place of the former treatment of stomach and intestines. Turning to ray therapeutics, Prof. Czerny admitted its efficacy after the knife in removing injuries, but was not inclined to attach very great importance to electricity applied as rays. In his opinion the more remedies we are confronted with the more difficult it is to find one's way to a proper treatment. This, he said, should be the work of the numerous institutes springing up in various civilised lands the express object of which is the study of this terrible scourge. On the whole, says the correspondent of *The Morning Post,* the address was couched in rather pessimistic tones, and the lecturer did not seem to share the hopeful views which have been lately expressed regarding the chemical, as opposed to the operative, treatment of the disease.

IN *The Popular Science Monthly* for August Prof. Richard Pearce gives an interesting historical survey of research in medicine, and Dr. Heinemann discusses cold-storage problems. The latter states that with careful treatment there are no appreciable differences in chemical composition between fresh meat and meat kept frozen for a period of two years.

IN the Farmers' Bulletin, No. 487 (U.S. Department of Agriculture), by Dr. Langworthy and Caroline Hunt, cheese and its economical uses in diet are considered. A number of recipes for the preparation of cheese dishes is given, and it is stated that cheese does not differ materially in its digestibility from meat, and, weight for weight, contains rather more protein and 50 per cent. more fat than cooked beef, and hence is a valuable food.

WE have received the August and September numbers of *The Child,* a monthly journal devoted to child welfare. Each contains a number of articles of general and special interest to those who have to deal with children—parents, educationists, doctors, and health visitors—notably one by Dr. Mary Scharlieb on adolescent girls from the point of view of the physician, in which the characteristics and management of adolescent girls are critically considered.

DETAILS are given of an improved respiration calorimeter, and the results of experiments with it by the U.S. Department of Agriculture (Exp. Station Record, vol. xxiv., No. 7, and Year-book for 1910). The influence of mental activity on metabolism was one of the subjects investigated, and in half the cases at least sustained mental effort had no positive influence upon the transformations of matter and energy within the body. The gaseous exchange and energy metabolism during the ripening of picked fruit, the germination of seeds, and the incubation of eggs are other subjects under investigation.

IN the August *Fortnightly Review,* Mr. Adolphe Smith discusses the present menace of cholera. He points out how cholera has been more or less prevalent on the Continent in various districts during the last three or four years, and directs attention to the danger that exists of the introduction of the disease into this country, particularly by way of some of the smaller ports, where sanitary administration is still very inadequate. He pleads for the establishment of a Ministry of Public Health, and for the burden of port sanitary administration to be placed on the country as a whole, and not on the local authority. Finally, he maintains that despite improvements in water supply, sewage disposal, and general sanitary conditions, poverty is the most potent of all those grim allies that join together to render devastating epidemics possible!

A RECENT number of the Annals of Tropical Medicine and Parasitology (vol. vi., No. 2) contains the results of investigations by H. B. Fantham and Annie Porter upon the destructive bee disease commonly known as "Isle of Wight Disease," together with a detailed description of the parasite and its life-history. The parasite, *Nosema apis,* belongs to the order Microsporidia, and is a close ally of *N. bombycis,* the parasite of silkworms, which causes the disease only too well-known as "pebrine," the subject of memorable researches by Pasteur. The method of infection was found to be contaminative; hereditary infection through the egg, as in *N. bombycis,* though by no means improbable, has not yet been proved to occur. The only certain means of destroying the resistant spores of the parasite and eradicating the infection is by fire. It is to be regretted that the authors should have thought it necessary to complicate the bibliography of Protozoa, already sufficiently vast, by setting forth their important results in three distinct and separate memoirs, which, as they are printed successively in the same journal, might easily have been included under one title.

MR. LUDWIG GLAUERT describes, in the first volume of the Records of the Western Australian Museum and Art Gallery (Perth, 1912, p. 47), an important series of remains of extinct marsupials from Balladonia. Eight of the species have not been recorded previously from Western Australia. The author supports Owen's view that Thylacoleo, the "marsupial lion," was carnivorous, and illustrates the worn enamel of its incisors.

To the July issue of *The Agricultural Journal of India* Mr. T. B. Fletcher, entomologist to the Madras Government, communicates an article, illustrated by a coloured plate, on termites or white ants. At the commencement reference is made to the modern view that these insects are not Neuroptera, but are more probably related to cockroaches and other Orthoptera, termites and cockroaches having many structural peculiarities in common. Then follows a full account of termite social economy.

A SHORT time ago the editor of *Popular Mechanics* (U.S.A.) conceived the idea of taking the votes of a number of scientific men on what inventions they considered to be the "seven wonders of the modern world," and for this purpose a list of numerous inventions was circulated, from which seven had to be selected. The result is published in the August number, and the seven inventions which received the highest number of votes are as follows:—Wireless, telephone, aëroplane, radium, antiseptics and antitoxins, spectrum analysis, X-ray.

WE learn from the daily Press that considerable anxiety is felt in France regarding the frequent deaths that have recently occurred through eating poisonous fungi. Three precautionary measures are suggested. One is to avoid gathering mushrooms having a persistent volva at the base of the stem; another is to boil every mushroom in water with a little salt; and a third is to have some animal charcoal at hand to be swallowed when a case of poisoning occurs. It is stated in the notices that no species is poisonous in which the volva is absent. It would be, however, wrong to regard all such species as esculent, for several well-known kinds having this characteristic certainly produce temporary, if not fatal, poisoning, at least unless subjected to prolonged boiling.

Two useful lists of South African plants have recently been published. Mr. J. Burtt-Davy and Mrs. Reno Pott-Leendertz (Annals of the Transvaal Museum, vol. iii.) have compiled a "first check-list" of the flowering plants and ferns of the Transvaal and Swaziland, enumerating about 3300 species. Mr. F. Eyles (*South African Journal of Science*, vol. viii.) gives a preliminary list of the plants of southern Rhodesia, comprising about 1700 flowering plants and ferns.

A NEW and curious species of "ground bean" (*Kerstingiella geocarpa*, Harms) from tropical West Africa is described and figured in the Kew Bulletin, No. 5, 1912. When the flowers are fully developed they are close to the ground, and after fertilisation the hitherto short stalk of the ovary lengthens into a long "carpopodium," which turns down and drives the young pod into the ground, where it matures. The same number contains a description and fine plate of a remarkable new spurge (*Euphorbia multiceps*, Berger) received at Kew from South Africa; it resembles a green pineapple with a number of spikes protruding irregularly from it, the stout fleshy axis being densely covered with short coral-like horizontal branches—the spikes are barren inflorescences, but no flowers have been seen. There is also a useful compilation of the various timbers and trees to which the terms tulipwood and tulip tree have been applied, just as other names (gum, rosewood, cedar, pine, mahogany, &c.) are indiscriminately applied to diverse timbers and trees.

MR. CECIL H. HOOPER has contributed to *Irish Gardening* for June and July an account of some interesting experiments on the pollination of hardy fruits, made by himself, Mr. F. Chittenden, and others. These experiments were made in order to ascertain whether fruits can set and mature without the aid of bees, whether mature fruit can be obtained by pollination with the pollen of the same variety or the same flower, and whether better fruits result from pollination with pollen of another variety. It was found that gooseberries and currants, raspberries and loganberries, though freely self-fertile, set better fruit when visited by bees; that strawberries are apparently to some extent wind-pollinated, though this needs confirmation. As is well known, more or less complete self-sterility is common among the many varieties of cherry, plum, apple, and pear; in the majority of cases pollen from another variety is essential for fruit formation. Details are given of numerous interesting results obtained by covering otherwise untouched flowers with muslin bags, by brushing with pollen from the flower's own anthers or from those of other plants of the same variety, and by pollination with pollen from other varieties. In connection with the interplanting of different varieties in orchards, lists are given according to the times of flowering. The author estimates that about 80 per cent. of the pollination of hardy fruits is done by the hive bee, about 15 per cent. by the various humble bees, and the remainder by miscellaneous insects.

THE meteorological year-book for Bremen, 1911, one of the regular German series, contains two important summaries in addition to the observations for the year in question:—(1) A discussion of the daily maximum and minimum temperatures for 1890–1910 (twenty-one years) by Mr. J. Siedenburg; and (2) monthly tables of the climate of Bremen for 1876–1910 (thirty-five years). This long series gives an absolute maximum temperature of 93·9° in May and an absolute minimum of −13·0° in December, but a reading of −17·1° is quoted as having occurred on January 23, 1823. The heat and drought of 1911 lasted from July 4 to September 27 (twelve weeks). Prof. Grosse ascribes the abnormal conditions principally to the shifting of the Azores pressure maximum to the north-east, and possibly to some extent to the approximate occurrence of the minimum sunspot period.

IN the *Atti dei Lincei*, xxi. (2), 2, Prof. Augusto Righi describes experiments on the convection of ions produced by magnetic or magneto-kathodic rays. According to the author's hypothesis these rays cause some of the electrons to unite with positive ions, the combination behaving like a double star or the system formed by a planet and its satellite. Once formed, they are carried by magnetic action from regions of greater to regions of lesser magnetic force, where the elements again frequently become dissociated. To dectect the presence of these ions, Prof. Righi makes use of a small cylinder of paper suspended by a fibre in the magnetic field generated by a second induction coil. According to theory the ions, by their impact on the cylinder, should cause the latter to rotate in the same direction as the magnetising current of the coil, and this was observed to be the case.

CERTAIN formulæ relating to the pressure of fluids on oblique planes have been recently quoted as "Avanzini's law." Col. de Villamil has made several inquiries as to where these laws were published, and having failed to obtain the information from others, has taken the matter up himself, and publishes an abstract of Avanzini's work in *The Aëronautical Journal* for July. The work in question was published in the *Memorie dell' Istituto nazionale italiano* at Bologna early last century, and deals with experiments on the relations between the velocity of a plate in still water, the angle of attack, the position of the centre of pressure, the density of the fluid, the length and breadth of the plate. The paper is illustrated by copies of the original diagrams, and contains experimental data. There are, however, several errors which require correction in the formulæ.

The annual report of the results of sight tests in the Mercantile Marine, for the year ending on December 31, 1911, just published as a Parliamentary paper (Cd. 6370), shows a slight increase in the percentage of failures, both in form and in colour vision, over the returns of the preceding year. 7309 candidates were examined, with 117 failures in form vision, none of whom were re-examined, and with 192 failures in the first examinations for colour vision, of whom 56 passed on re-examination. This gives a percentage of 1·89 failures in colour vision, as against 1·51 in 1910, and is the largest proportion yet recorded. The methods of testing employed were the same as in 1910, the recommendations of the Departmental Committee appointed in that year not having yet been acted upon. Those recommendations included the substitution of a dark brown test skein for the deep red at present in use, and the employment of a special lantern, designed by the committee, for all candidates. Preparations are being made to carry these alterations into effect at the earliest possible time, and they seem calculated to meet all reasonable objections to the tests hitherto employed. An article on the report of the committee appeared in Nature of July 4 (vol. lxxxix., p. 453).

Vol. v. of the Journal of the Municipal School of Technology, Manchester, a record of investigations published by the staff and students during 1911, extends to nearly 300 pages. Like its predecessors, it shows the unique position as a centre of research in applied science occupied by the Manchester School amongst the technical schools of this country. Three of the nineteen papers reprinted deal with pure science, and of them that by Prof. Gee and Mr. Adamson, describing a neat and simple "dioptriemeter" for measuring the focal lengths of lenses by the deviation produced, may be specially mentioned. Of the technical papers, the most important are that on electricity meters, by Messrs. Ratcliff and Moore, read before the Institution of Electrical Engineers, that on the electrical theory of dyeing, by Mr. W. Harrison, who finds in the theory explanations of many facts previously not interpreted, and that on boiler economics by the use of high gas speeds, by Prof. Nicholson, who shows how boilers may be reduced in size about 30 per cent. without any diminution in their steam production. The journal is printed in the printing crafts department of the school, and its execution does credit to that department.

Under the title of "Geostatic Funiculars,' Prof. A. F. Jorini, writing in the *Rendiconti del R. Istituto lombardo*, xlv., 13, gives a solution of the problem presented by a cylindrical tunnel subjected to earth pressure, the surface of the superincumbent earth being horizontal.

Prof. C. Mataix's papers on aëroplane stability in the *Revista de la Sociedad matemática española* conclude with the July number. The author succeeds in satisfying the conditions for longitudinal but not lateral stability. The latter failure is due to the character of the systems of surfaces assumed in the investigation. If the author had studied a system furnished with two vertical auxiliary surfaces or fins, he would have had no difficulty in satisfying the necessary conditions, and it is to be hoped that readers of the paper will not accept the conclusion that *all* systems of planes are laterally unstable.

In a paper read recently by Mr. Edwin O. Sachs, at the New York International Congress on the testing of materials, the author directs attention to the very small amount of scientific testing of reinforced concrete which has been carried out in Britain. Our public institutions have been very remiss, for there is practically nothing to place beside the elaborate researches carried out by engineering professors in the public laboratories of the United States, Germany, and France. The author thinks that it is almost hopeless to expect our Government or our engineering colleges to pay now any attention to the matter, so that we can only look for a continuance of the efforts of private bodies, such as the professional societies intimately concerned.

OUR ASTRONOMICAL COLUMN.

Gale's Comet, 1912*a*.—The comet discovered by Mr. Gale on September 8 is apparently becoming brighter and travelling northwards. A second telegram from Kiel states that it was observed at Santiago on September 11, when its position at 7h. 49·2m. (Santiago M.T.) was:—

R.A. = 13h. 54m. 2·4s., decl. = 33° 10′ 50″ S.

Comparing this with the position at the time of discovery, we see that the comet moved about 4° 15′ to the east and 3° 20′ northwards in a little more than two and a half days. In a telegram announcing the discovery, Reuter's Agency gave the magnitude as 6; the Santiago observer reports it as 5, so that there is a possibility of the comet becoming a more or less conspicuous object in our evening sky. When discovered, the comet was about half-way between θ and Centauri, and is apparently travelling towards the neighbourhood of α Libræ; this region now sets at about 7 p.m.

In the *Astronomische Nachrichten* (No. 4601) Herr Prager describes the object seen at Santiago as round, diameter 2′, magnitude between 3 and 6, nucleus, no tail.

The Total Solar Eclipse of October 10.—From *The Observatory*, No. 452, we learn that the eclipse party from Greenwich, consisting of Messrs. Eddington and Davidson, with Mr. J. J. Atkinson as a volunteer, left for Brazil on August 30. They expect to make their observations from Christina, some 150 miles inland from Rio de Janeiro, and the programme includes the direct photography of the corona, the photography of the ultra-violet spectra of the corona and chromosphere, and an attempt to secure mono-